

New PVT Sampler Saves Operation Time

The Compact Production Sampler is an electrically-actuated, conventional, bottomhole reservoir fluid sampling tool. Its modular and through-wired design means it can be integrated into any Schlumberger production logging operation, and it has the flexibility to run in any section of the PS Platform* production logging string – slickline or electric-line conveyed – to avoid interfering with a client's preferred production logging tool configuration. The through-wired design also allows, for the first time, a full-bore flowmeter to be run at the bottom of the production logging string simultaneously with bottomhole samplers.

The tool can be actuated by timer-delay or surface actuation on electric line and on slickline with the service company's electronic firing-head system, or a combination of surface and timer-delay relay, allowing the sampling program to be run with maximum flexibility and minimum downtime. The surface actuation capability is particularly useful when the bottomhole samplers are run on coiled tubing or wireline tractor in horizontal wells where actuation by time delay runs the risk of wasting time in the hole or requiring a rerun if the tools do not reach the sampling depth before taking a sample.

Statoil used the sampler successfully in its light well intervention (LWI) program on wells in the Åsgard field in 2006, with a total of eight runs of the tool, all recovering samples. The Åsgard intervention project team was faced with the challenge of finding a tool that could take bottomhole samples on electric line in high temperature wells (greater than 150° C).

A wide range of intervention activities were planned and executed including setting plugs, perforation of new zones and re-perforation of some previously producing zones, acquisition of production data from commingled producers and injectors, and bottomhole sampling for PVT and tracer analysis. A main goal for the project team was to gain a better understanding of reservoir communication and resistivity.

The project team ran the bottomhole samplers on full production logging strings, with a full-

bore flow meter at the bottom of the string. This equipment combination allowed the acquisition of all data for production logging, followed by activation of the samplers.

For each of the first two wells, the first sampler's firing mechanism was surface activated, and a time-delay activation was pre-set for the second chamber 1/2 hour after surface activation.

In a subsequent well, four sample chambers were run in combination with the inline spinner. The first sample was activated from the surface, with the second, third and fourth pre-set for activation after the first. The third firing included two samples taken at the same point for quality checking.



A technician uses the hand-held programmer to pre-set the actuation time of the Compact Production Sampler before running it into the hole

In one case, delays were experienced with the wireline tractor reaching the desired sampling depth. If only time-delay actuation had been used, it most likely would have been necessary to pull out of the hole, reload a new sampler, and rerun the string to correctly obtain the sample at the depth of interest.

The ability to run the Compact Production Sampler service in combination with other services, such as a production logging string, resulted in an estimated saving of 24 hours of operating time in two of the interventions.

For ease of deployment, this compact tool ranges in length from 2 to 2-1/2 metres (6-1/2 to 8-1/2 feet), depending on the mode of operation, which allows more tools to be run than would otherwise be possible when there is limited wireline lubricator height available for rig-up.

For certain operations, such as onshore single-well PLT operations where sample transfer, analysis and tool redress are not required at the wellsite, the sampler can be run by the service company's production logging or slickline field personnel, without the need for a sampling specialist, providing a cost savings.

The Compact Production Sampler is a mercury-free, positive-displacement sampler that captures a 100-cc conventional bottomhole sample. The sample chamber is transportable, eliminating the need for well-site transfers and allowing the sample cylinder to be shipped directly to the lab for analysis. The sample chamber also features an integral agitation device for recombination of the sample at reservoir pressure and temperature prior to PVT analysis.

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